S1 Line Strike Hwy 121 Incident – McKinney, TX
Preliminary Air Monitoring Summary
February 04, 2017

Prepared by
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)
On Behalf of Enterprise Products Partners, L.P.

CTEH CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

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Introduction

On January 30, 2017, the Center for Toxicology and Environmental Health, LLC (CTEH®) initiated air monitoring and sampling following a line strike to the Enterprise Products S1 pipeline near McKinney, TX. Real-time air monitoring and analytical sampling were initiated to monitor product recovery operations and the surrounding community. Real-time air monitoring consisted of roaming hand-held monitoring, fixed-remote telemetering stations, and a roaming telemetering monitoring unit. Analytical air sampling consisted of personal sampling and community air sampling.

This report summarizes air monitoring data recorded from February 3, 2017 at 07:00 to February 4, 2017 at 07:00. Appendix I contains incident site maps and sampling locations.

Real-time Air Monitoring[1]

Real-time air monitoring was conducted to document and quantify the potential release of fugitive emissions (if any) resulting from the release. All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Target analytes were measured as total volatile organic compounds (VOCs), benzene, hydrogen sulfide (H_2S), and percent of the lower explosive limit (%LEL) using remote telemetering RAESystems® AreaRAEs, handheld instruments, such as RAESystems® MultiRAEs (MRs) and Gastec® colorimetric detection tubes. Fixed location monitoring was conducted using five AreaRAE monitoring stations (AR) placed along Hwy 121 along the incident site and work area. One roaming AreaRAE unit was deployed inside the cab of an excavator removing soil.

Table 1, presented below, summarizes data for roaming, hand-held instruments in the work area.

Table 1: Hand-held Real-time Air Monitoring Summary[1]
February 3, 2017 at 07:00 to February 4, 2017 at 07:00

Location Category	Analyte	Instrument	Count of Readings	Count of Detections	Range of Detections[2]
	%LEL	MultiRAE	57	0	< 1 %
	Benzene	UltraRAE	54	6	0.05 – 0.40 ppm
Worker Monitoring	H_2S	MultiRAE (Pro)	55	0	< 0.1 ppm
	H_2S	MultiRAE (Plus)	14	0	< 1 ppm
	VOC	MultiRAE	164	75	0.2 – 66.9 ppm

[1]Please Note: The data displayed in the above table has not undergone complete QC analysis and is presented in preliminary format.
[2]Values listed under Range of Detections preceded by the "<" symbol are considered non-detections and the limit of detection (LoD) value is listed to the right.

[1] *Real-time air monitoring provides near instantaneous measurements for concentrations in air without the need for laboratory analysis.*

Table 2: Remote Telemetering Real-time Air Monitoring Summary[1]

February 3, 2017 07:00 to February 4, 2017 at 07:00

Unit	Analyte	Count of Readings	Count of Detections	Range of Detections[2]
AR07	%LEL	2641	0	< 1 %
	VOC	2641	97	0.1 – 4.5 ppm
AR08	%LEL	2657	0	< 1%
	VOC	2657	0	< 0.1 ppm
AR09	%LEL	2580	0	< 1 %
	VOC	2580	512	0.1 – 0.8 ppm
AR10	%LEL	2483	0	< 1 %
	VOC	2483	4	0.1 ppm
AR11	%LEL	2096	0	< 1 %
	VOC	2096	1536	0.1 – 63 .7 ppm

[1]*Please note: The data displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*

[2]*Values listed under Range of Detections preceded by the "<" symbol are considered non-detections and the limit of detection (LoD) value is listed to the right.*

Analytical Air Sampling

Analytical air samples were collected during this time period to assess potential worker exposure and potential off-site migration of target analytes during product recovery operations. Five samples were collected in the breathing zone of personnel conducting various recovery operations and analyzed for benzene, toluene, ethylbenzene, xylene, and n-hexane in accordance with NIOSH Method 1501 and the OSHA benzene substance-specific standard. Four minican evacuated canister samples were set out in the community to assess for the potential presence of crude oil constituents. All samples will be sent to an American Industrial Hygiene Associate (AIHA) accredited laboratory for analysis of VOCs in accordance with USEPA TO-15.

Table 3: Cumulative Analytical Sample Count

February 4, 2017 07:00

Analyte	Count of Samples Collected	Count of Results Received from Lab	Count of Received Validated Data Reports
BTEX	24	0	0
TO-15 List	4	0	0

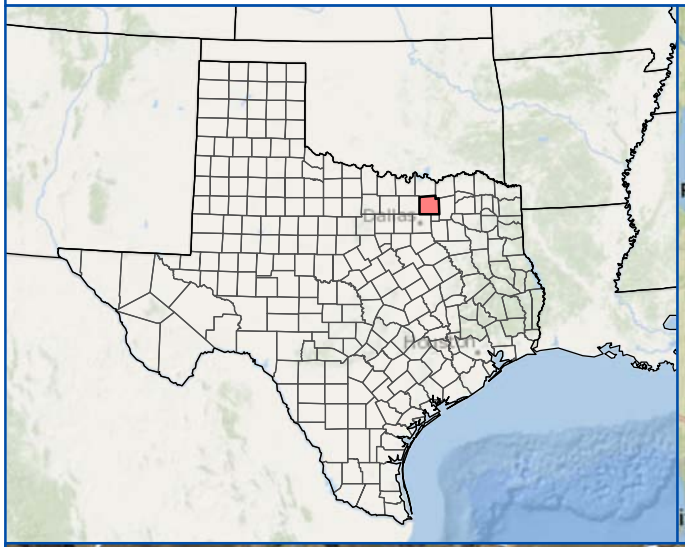
Appendix I:

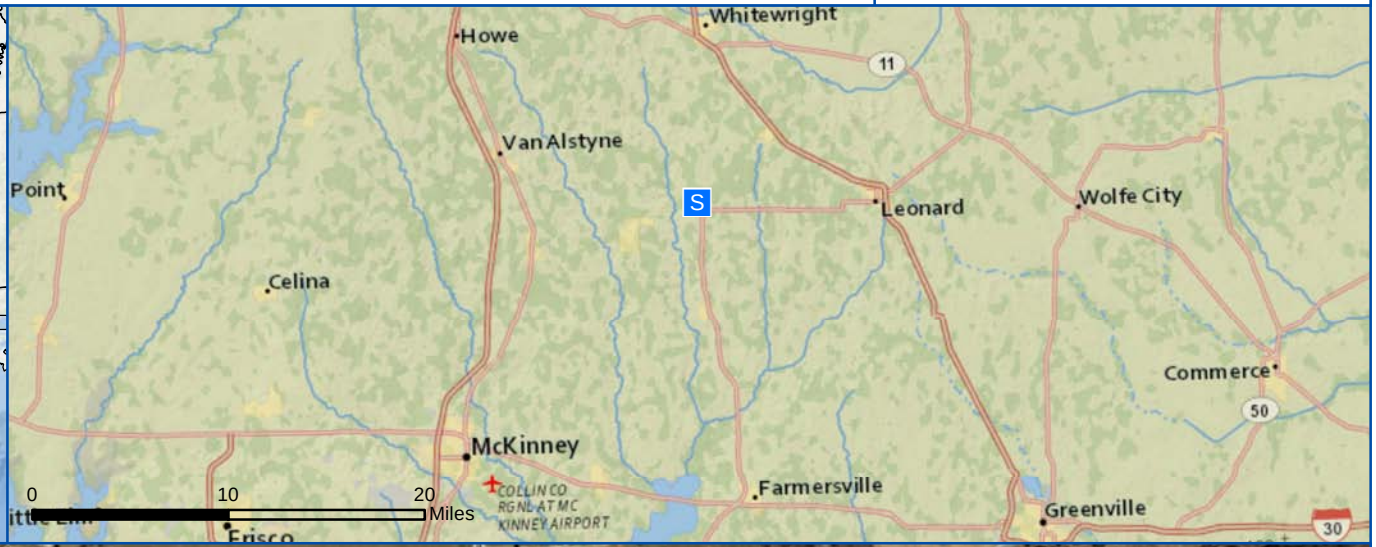
Incident Site Maps

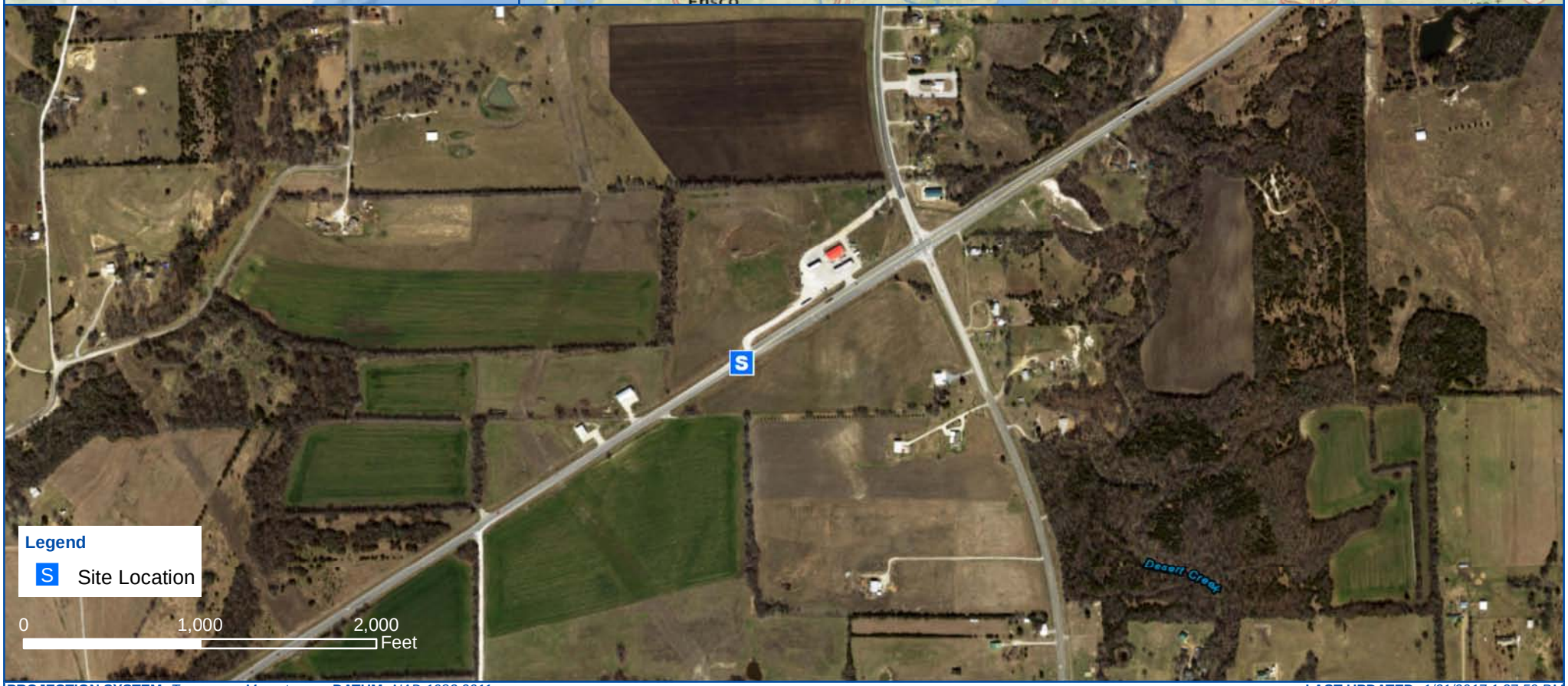
Incident Site Location

S1 Line Strike Hwy 121

Project: 108835
Client: Enterprise Products
City: McKinney, TX
County: Collin





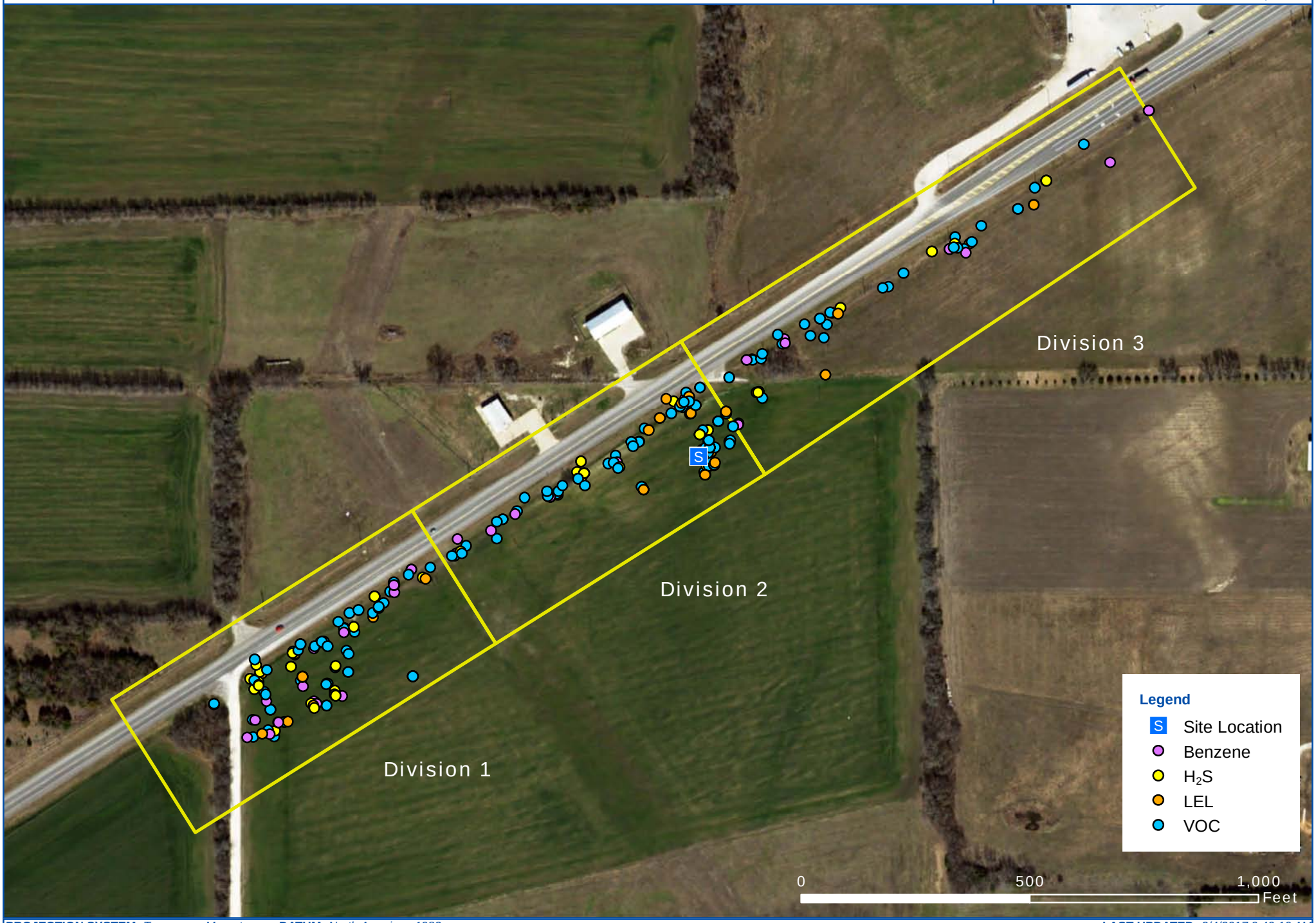


PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *NAD 1983 2011* **LAST UPDATED:** *1/31/2017 1:37:59 PM*

Manually-Logged Real-Time Air Monitoring Reading Locations

S1 Line Strike Hwy 121 Incident - February 3 at 07:00 to February 4 at 07:00

Project: 108835
Client: Enterprise Products
City: McKinney, TX
County: Collin



PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *North American 1983* **LAST UPDATED:** *2/4/2017 9:40:10 AM*

AreaRAE and Minican Locations

S1 Line Strike Hwy 121 Incident

Project: 108835
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County: Collin

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *North American 1983* **LAST UPDATED:** *2/4/2017 9:37:15 AM*